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MS APPEAL BRIEF - PATENTS
Docket No.: 3430-0164P
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Keuk-Sang KWON et al.

Application No.: 09/750,162

Confirmation No.: 006546

Filed: December 29, 2000

Art Unit: 2674

For: LIQUID CRYSTAL DISPLAY DEVICE
HAVING QUAD TYPE COLOR FILTERS

Examiner: J. E. Lesperance

APPEAL BRIEF TRANSMITTAL FORM

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Transmitted herewith is an Appeal Brief on behalf of the Appellants in connection with the above-identified application.

☐ The enclosed document is being transmitted via the Certificate of Mailing provisions of 37 C.F.R. § 1.8.

A Notice of Appeal was filed on September 1, 2005.

☐ Applicant claims small entity status in accordance with 37 C.F.R. § 1.27.

The fee has been calculated as shown below:

☒ Extension of time fee pursuant to 37 C.F.R. §§ 1.17 and 1.136(a) - \$120.00.

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Application No.: 09/750,162

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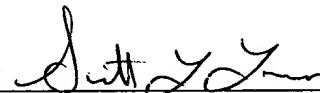
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Dated: NOV. 29, 2005

Respectfully submitted,

By



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For: LIQUID CRYSTAL DISPLAY DEVICE HAVING
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APPEAL BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

As required under § 41.37(a), this brief is filed more than two months after the Notice of Appeal filed in this case on September 1, 2005, and is in furtherance of said Notice of Appeal.

The fees required under § 41.20(b)(2), and any required petition for extension of time for filing this brief and fees therefor, are dealt with in the accompanying TRANSMITTAL OF APPEAL BRIEF.

This brief contains items under the following headings as required by 37 C.F.R. § 41.37 and M.P.E.P. § 1206:

| | | | | |
|------------|---|-------------------|----------|-----------|
| I. | Real Party In Interest | 11/30/2005 JADD01 | 00000085 | 09750162 |
| II | Related Appeals and Interferences | | | |
| III. | Status of Claims | 01 FC:1402 | | 500.00 OP |
| IV. | Status of Amendments | | | |
| V. | Summary of Claimed Subject Matter | 11/30/2005 JADD01 | 00000084 | 09450162 |
| VI. | Grounds of Rejection to be Reviewed on Appeal | | | |
| VII. | Argument | 01 FC:1402 | | 500.00 OP |
| VIII. | Claims | | | |
| IX. | Evidence | | | |
| X. | Related Proceedings | | | |
| Appendix A | Claims | | | |

I. REAL PARTY IN INTEREST

The real party in interest for this appeal is:

LG. Philips LCD Co., Ltd., of Seoul, Korea as indicated by the Assignment filed on August 23, 2001 at Reel 012100 and Frame 0110.

II. RELATED APPEALS, INTERFERENCES, AND JUDICIAL PROCEEDINGS

There are no other appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

A. Total Number of Claims in Application

There are 14 claims pending in application.

B. Current Status of Claims

1. Claims canceled: 6
2. Claims withdrawn from consideration but not canceled: None
3. Claims pending: 1-5, 7-15
4. Claims allowed: 12, 13
5. Claims rejected: 1-5, 7-11, 14, 15

C. Claims On Appeal

The claims on appeal are claims 1-5, 7-11, 14, 15

IV. STATUS OF AMENDMENTS

The Amendment filed on March 7, 2005 was refused entry in an Advisory Action dated March 29, 2005. However, this Amendment was then entered by way of an RCE filed on April 7, 2005.

V. SUMMARY OF CLAIMED SUBJECT MATTER

In general, the present invention is a liquid crystal display device having a liquid crystal panel with gate and data lines. Integrated circuits for driving the gate lines and other integrated circuits for driving the data lines are included. This type of arrangement is generally known in the prior art. Figure 6 shows gate lines 315 and data lines 313 being driven by gate driving integrated circuits (unnumbered boxes on both sides of the panel) and data drive integrated circuits 311. The gate and data lines are used to drive subpixel regions. That is, for a color display, it is known to use 4 subpixels in order to be combined to form the color for a single pixel. As is shown in Figure 6, 4 subpixels are shown including 1 red, 1 blue and 2 green subpixels. This arrangement is also generally known in the prior art.

It is known that providing a direct current bias to a liquid crystal layer can deteriorate the layer. Thus, it is preferable to reverse the polarity of the voltage applied to the liquid crystal in succeeding frames. Several methods for doing this are known in the prior art. In Figure 2A, all the pixels have the same polarity and go from positive polarity to negative polarity in succeeding frames. Another arrangement is shown in Figure 2B where entire columns are kept at the same polarity and reverse from one frame to the next. Likewise, Figure 2C shows a similar arrangement where the same polarity is applied in the row direction. The fourth arrangement known in the prior art is shown in Figure 2D where individual pixels reverse polarity. However, these arrangement may produce variations in the optical characteristics of the pixel due to signal delays in the data lines. Also, due to the arrangement of the integrated circuits, specific methods of injecting the liquid crystal in the manufacturing process may be necessary.

The present invention utilizes a different arrangement of the subpixels and their connections to the integrated circuits in order to avoid these problems. The data drive integrated circuits 311 have a capacity of, for example, 384 lines. When 4 of such integrated circuits are utilized as shown in Figure 6, 1,536 channels are available. A typical liquid crystal panel only needs 1,024 such channels. Thus, 512 channels or 1/3 of the total are not necessary. Applicants have arranged these unnecessary channels as floating channels and arranged them in a manner such that certain benefits occur. As shown in Figure 7, the floating channels, which are indicated by dotted line arrows, occur at the second, fifth, eighth and so on positions. That is, they occur every third channel starting with the second channel from the left. As shown in the bottom lines of Figure 7, the colors identified with these different channels can be seen in two rows of pixels. The floating channels are not applied to pixels but do receive the input signal from

the drive IC. If alternating polarity signals are applied to a first row of pixels and a similar arrangement are also applied to the column below, the pixels receive the polarity indicated in Figure 8A. Figure 8A does not show the floating lines which occur between pairs of similar polarity. Thus, the two left hand positive signals correspond to channels 1 and 3 and the floating channel which would be negative, is not shown in Figure 8A. The next two negative signals correspond to channels 4 and 6 with the floating channel 5 being positive. Thus, by alternating the polarity of the signals across the row and having the specific arrangement of floating channels, a simple arrangement is produced, where the four colors of the pixels all have the same polarity at the same time.

Claim 1 describes a liquid crystal display device having gate lines 315 and data lines 313 connected to data driving integrated circuits (unnumbered) and data drive integrated circuits 311. The data drive integrated circuits have "m" channels (seen as numbers 1-384 in Fig. 7). The second, fifth, ... (3n-1)th channels are floating, as indicated by the dotted line arrows. The result of this is pairs of pixels of the same polarity (in Figure 8A, pairs of channels having either positive or negative polarity) separated by a floating state of an opposite polarity (not shown in Figure 8A, but corresponding to the floating channels of Figure 7 and occurring between pairs of the same polarity).

Independent claim 5 is a similar arrangement which has a liquid crystal display panel with a plurality of drive integrated circuits 311 having "m" channels, of which "n" are floating channels, at the second, fifth, ... (3n-1)th channels. A plurality of films connect the drive integrated circuits having a number of lines (m-n), shown as the solid arrow channels in Figure 7. Pairs of positive polarity are separated by floating states of opposite polarity as shown in Figure 7 and 8A.

Claims 2, 3, 4, 8 and 14 depend from claim 1 and derive their allowability from the independent claim. Likewise, claims 7, 9, 10, 11 and 15 depend from claim 5. Claims 2 and 9 describe the four colors of the subpixels. Claims 3 and 7 define m as 384. Claims 4, 10, 14 and 15 define the number of drive integrated circuits. Claims 8 and 11 locate the drive integrated circuits on only 1 side of the panel.

VI. GROUNDS OF OBJECTION TO BE REVIEWED ON APPEAL

Claims 1-5, 7-11, 14 and 15 have been rejected under 35 U.S.C. § 103 as being obvious over the admitted prior art in view of Oh et al. (U.S. Patent 5,856,818). Applicants submit that independent claims 1 and 5 contain limitations which are not seen in the admitted prior art and not seen in the Oh et al.

reference. Further, these limitations would not be obvious over the combination of the admitted prior art and Oh et al.

VII. ARGUMENT

The Examiner has rejected all of the claims as being obvious over the admitted prior art in view of Oh et al. The Examiner states that the admitted prior art shows a liquid crystal display with gate and data lines, and integrated circuits having a number of channels. The Examiner admits that the admitted prior art does not disclose any particular arrangement of pixels separated by a floating state of opposite polarity. Applicants do not disagree with the Examiner's statement of the admitted prior art.

The Examiner cites Oh et al. to show that the use of more than three data drive IC's in a single bank structure is known. The Examiner also states that Oh et al. does not teach the arrangement of pixels separated by the floating state of opposite polarity. Applicants do not disagree with the Examiner's understanding of Oh et al.

The Examiner feels it would have been obvious to one of ordinary skill in the art to spread out the floating channels over the entire drive IC in order to provide a good balance in preventing the waste of liquid crystal inserted between the substrates. Applicants disagree with the Examiner's Statement of Obviousness.

First, Applicants submit that there is no hint in either the admitted prior art or the Oh et al. reference to spread out the channels as suggested by the Examiner. Likewise, there is no motivation indicated for doing this. The Examiner has stated that this would provide a good balance, but there is still no motivation of a need to have good balance.

More importantly, Applicants submit that the claims recite a specific arrangement of the floating channels and that there is no reason for the specific arrangement to be accomplished based on the admitted prior art or Oh et al. Once the advantages are discovered of a particular arrangement, it might be obvious to perform the actual rearrangement, but there is no reason why one skilled in the art would pick the particular arrangement without having seen the end advantages. In the present application, Applicants have specifically arranged the floating channels to occur in every third channel so that alternating polarity signals will produce pairs of similar polarity separated by pairs of opposite polarity. Nothing in the admitted prior art or the Oh et al. reference suggests that such an arrangement is advantageous. Without

seeing that this arrangement produces advantageous results, it would not be obvious in view of the admitted prior art and Oh et al. to rearrange the floating channels in this manner. Applicants submit that it is the arrangement of these channels that is at the heart of the present invention and that there is no hint in any manner in the admitted prior art or in Oh et al. to make this arrangement. Further, Applicants submit that it would not be obvious to one having ordinary skill in the art based on the admitted prior art in Oh et al. to make this arrangement, except in hindsight after viewing the present invention. Further, Applicants submit that it would not be obvious to come up with the specific arrangement of polarity just on the basis of spreading out the channels to prevent a waste of liquid crystal.

It should also be noted that the Examiner has allowed claims 12 and 13 which are very similar to claims 1 and 5, respectively, except in the final paragraph where the arrangement is described. Applicants submit that while this description of the location of the floating state is worded differently than that in the allowed claims, Applicants believe that this arrangement is also not seen in the references and accordingly is allowable for the same reasons as claims 12 and 13.

VIII. SUMMARY

In view of the arguments presented above, Applicants submit that the rejection of the Examiner should be reversed.

IX. CLAIMS

A copy of the claims involved in the present appeal is attached hereto as Appendix A.

X. EVIDENCE

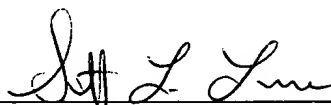
No evidence pursuant to §§ 1.130, 1.131, or 1.132 or entered by or relied upon by the examiner is being submitted.

XI. RELATED PROCEEDINGS

No related proceedings are referenced in II. above, or copies of decisions in related proceedings are not provided, hence no Appendix is included.

Dated: NOV. 29, 2005

Respectfully submitted,

By 
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APPENDIX A

Claims Involved in the Appeal of Application Serial No. 09/750,162

1. A quad type liquid crystal display device, comprising:
a liquid crystal panel having gate and data lines which define sub-pixel regions;
gate driving integrated circuits for driving the gate lines; and
a plurality of data drive integrated circuits arranged on one side of the liquid crystal panel, each of the data drive integrated circuits having “m” (m is a natural number) number of channels,
wherein 2nd, 5th, ... (3n-1)th (n is a natural number) channels for each data drive integrated circuit are floating;
wherein pairs of pixels of the same polarity are separated by a floating state of an opposite polarity and adjacent pairs have opposite polarity.
2. The device of claim 1, wherein each of two by two sub pixels corresponds to red, a first green, a second green, and blue color filters, respectively.
3. The device of claim 1, wherein m is 384.
4. The device of claim 1, wherein the number of data integrated circuits is four.
5. A liquid crystal display panel;
a plurality of drive integrated circuits for driving the panel, each of said plurality of drive integrated circuits having “m” (m is a natural number) number of channels and “n” (n is a natural number) number of floating channels wherein 2nd, 5th, ... (3n-1)th channels are floating and

a plurality of films for connecting the drive integrated circuits, each film having (m-n) number of lines,

wherein $n < m$; and

wherein pairs of pixels of the same polarity are separated by a floating state of an opposite polarity and adjacent pairs have opposite polarity.

7. The liquid crystal display panel of claim 5, wherein m is 384.

8. The device of claim 1, wherein the data drive integrated circuits are located on only one side of the liquid crystal panel.

9. The liquid crystal display panel of claim 5, wherein each of two by two sub pixels corresponds to red, a first green, a second green, and blue color filters, respectively.

10. The liquid crystal display panel of claim 5, wherein the number of drive integrated circuits is four.

11. The liquid crystal display panel of claim 5, wherein the drive integrated circuits are located on only one side of the liquid crystal panel.

14. The device of claim 1, wherein there are at least three of said plurality of data drive integrated circuits.

15. The liquid crystal display panel of claim 5, wherein there are at least three of said plurality of drive integrated circuits.

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